Figure 1. Chest x-ray film before ECLS (*left*). It was done on the admission of the patient and shows bilateral pulmonary edema and heart enlargement, with a cardiothoracic index of 0.60. Chest x-ray film 1 day after ECLS institution (*right*). Pulmonary edema is already greatly reduced, and cardiothoracic index decreased to 0.45.

successful management of acute necrotizing eosinophilic myocarditis (ANEM) with a biventricular assist device (BIVAD) and steroids.

ANEM is indeed a dramatic condition often leading to a fatal issue unless promptly managed with circulatory support and steroid administration.² Endomyocardial biopsy is essential to diagnosis confirmation and rapid therapeutic choice making.

The particularity of ANEM is rapid and spectacular circulatory improvement when steroids are administered early enough.² Therefore, we think that a BIVAD is probably too aggressive and that a far less-invasive mean, such as extracorporeal life support (ECLS), is more appropriate for such a condition.

One month ago, we had a case similar to that described by Kohout and colleagues.¹ A 19-year-old woman presented to our department with abrupt onset of congestive heart failure and respiratory distress. She had been already intubated before admission, and echocardiography showed a much altered heart function, with moderately dilated left and right ventricles, and a left ventricular ejection fraction of less than 10%. Computed tomography scan ruled out pulmonary embolism and confirmed severe pulmonary edema. The girl had an unremarkable medical history, with no proof of drug abuse or medications. She had no other

symptoms suggesting a preexisting disorder except for mild abdominal pain 1 day earlier. Blood examination results showed no particularity. Serologic and polymerase chain reaction screening results for viral or other infectious diseases returned to normal later on.

In this context of severe congestive heart failure, a femoro-femoral ECLS was instituted in the special care unit at the patient's bedside, with a blood output of 3.5 L/min. Inotropic support with norepinephrine and dobutamine was also started. Adequate unloading of the left and right-sided heart chambers was assessed with a Swan-Ganz catheter and echocardiography.

On day 1, chest radiography showed a great reduction of the pulmonary edema (Figure 1). An endomyocardial biopsy was performed, which confirmed the diagnosis of ANEM on day 2. Steroids were immediately begun. The improvement was spectacular. As soon as day 6, echocardiography showed marked improvement of the cardiac function. Weaning from ECLS was begun on day 7 and removed on day 10. Cardiac echocardiography showed a completely normalized left ventricular function. The patient was discharged from the special care unit on day 13.

When ANEM is suspected, we think that ECLS is an excellent device for first-line circulatory support. Prompt endomyo-

cardial biopsy is mandatory to confirm the diagnosis and initiate intravenous steroids. This offers the advantage of avoiding the primary use of a far more aggressive mean of circulatory support, such as a BIVAD, in a condition that is likely to respond rapidly and favorably to steroids. In case the biopsy rules out ANEM, then ECLS, if insufficient, could be removed, and other more aggressive means of circulatory support instituted.³

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Reply to the Editor:

We thank Dr Khabbaz and colleagues for their contribution to the management of acute necrotizing eosinophilic myocarditis with mechanical circulatory assist. In our article,¹ we make no attempt to suggest that ventricular assist device (VAD) support is the only method by which to properly manage the disease. On the contrary, we recognize the fact that this is a life-threatening disorder on the one hand, but responsive to steroid therapy on the other. Treatment strategies have ranged from steroid therapy alone² to transplantation.³ The main message in our article and others is to support the circulation while the diagnosis is made and treatment is initiated. The precise method by which to accomplish these ends varies according to the condition of the patient at the time of presentation, the tools and technologies available at the treating

institution, and the response to steroids. Not every case will be diagnosed antemortem, and not every pathology will respond favorably to steroids. Thus, treatment must take into consideration the possibility that bridge to recovery or bridge to transplant is conceivable. VAD support, therefore, is an excellent tool to accomplish the goal—particularly with a VAD that has features such as short- or long-term support, bridge to recovery or transplant, ambulation with possibility for home discharge, and so forth. In addition, a VAD that has left ventricular (LV) apical cannulation allows for optimal unloading of the LV while on support, antegrade flow pattern, and pulsatile flow. Although extracorporeal life support (ECLS) has been used extensively for acute circulatory decompensation, the femoral–femoral circulation is suboptimal in terms of resting the LV and counterproductive when the LV recovers and weaning is attempted—there is conflicting flow from the heart antegrade and femoral flow retrograde. Furthermore, extracorporeal membrane oxygenation introduces an oxygenator, which is appropriate when lung injury is associated with the heart condition but potentially detrimental when it is not. In addition, femoral cannulation is associated with the potential for vascular complications (both venous and arterial), prevents movement of the patient in the bed or at the bedside, and limits flow by the relatively small size of the cannulae. These views were shared by other surgeons in a discussion of acute heart failure with various types of mechanical circulatory assist technologies.⁴

We congratulate Dr Khabbaz and his team for their wonderful success and encourage others to think about mechanical circulatory support when confronted with a severe case of acute necrotizing eosinophilic myocarditis. The use of ECLS is not an unreasonable method to rapidly restore circulatory stability. However, in the event that ECLS is insufficient, then a more advanced form of mechanical circulatory support, such as a VAD, is appropriate.

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Modern drainage techniques include not only smaller drains for pain reduction

To the Editor:

In a prospective, randomized, controlled trial, Roberts and colleagues¹ recently demonstrated that the performance of small-bore Blake drains (19F) (Ethicon Inc, Somerville, NJ) is not inferior to that of standard Portex drains (28F) (Portex, Inc, Hythe, Kent, UK) after cardiac surgery. The study provides important evidence on the efficacy of modern drainage techniques. However, we have some comments.

The authors compared 199 patients undergoing first-time cardiac procedures; 90 patients received Blake drains, and 109 patients received standard Portex drains. We are not convinced that the influence of complex valve procedures, which are more frequent in the Blake group, is not statistically relevant. Furthermore, we believe that a homogenous patient group might demonstrate the advantage of silastic Blake drains and allow extrapolation to other patient groups.

Akokuwah and colleagues² demonstrated less pain with Blake drains, but, as mentioned by Roberts and colleagues,¹ with only a small patient group (70 patients with 35 in each group). Therefore, it is a pity that the authors did not assess pain with a visual analog scale score, which is easy to perform.

Finally, the authors somehow misquoted our correspondence on the article by Barnard and colleagues:³ We do not believe that “. . . the only way to reduce patient discomfort is to use smaller and softer drains.” In fact, we stated that a modern drainage technique is a

fundamental part in pain reduction while removing drains after thoracic and cardiac surgery. Of course, analgesia, special removal maneuvers, and so forth have value, as demonstrated in various studies.⁴ In our unit, 10F to 19F Blake drains are used in all patients (1800 patients/year). Our observations are consistent with the literature: The Blake drain system is as effective as conventional drains with no increased risk of retained blood in the chest or tamponade and significantly less pain for the patient. We therefore advocate the use of Blake drains in patients undergoing thoracic or cardiac surgery as well.

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Reply to the Editor

We thank Dr Mair and colleagues for their interest in our study¹ and for their comments to which we would like to reply.

First, we agree that homogenous patient groups avoid confounding variables; the influence of complex valve procedures is one that was mentioned. However, we do not agree that it was the heterogeneity of the patient groups that prevented us from demonstrating an advantage of the Blake system (Ethicon Inc, Somerville, NJ). Our study was powered on the statistical basis of testing noninferiority, which allows statistical comparison with a predefined level of difference between groups. Had the study hypothesis been that Blake drains