

tive right ventricle below the attachment of the valve or the right ventricle with the atrialized right ventricle? In most of the patients on whom my own group has operated, the right anterior wall was dilated and hypokinetic.<sup>4</sup> I am interested to know whether this aspect was present in Chen and colleagues' series.<sup>1</sup>

The postoperative decrease of right ventricular ejection fraction could be due to the section of abnormal muscular trabeculations. It is in my mind an additional reason to decrease the preload of the right ventricle with a partial Glenn procedure.

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## Reply to the Editor:

My coauthors and I are in agreement with Dr Chauvaud's impression that the Ebstein anomaly is a combination of ventricular and valvular disease. In our study, the right ventricle, as analyzed by transthoracic echocardiography, was considered to be the effective right ventricle below the attachment of the valve. In several patients—most notably the adults—the right anterior wall was indeed hypokinetic. Care certainly must be taken not to assign hypokinetic areas of atrialized ventricle to the true right ventricle. We have not routinely used a Glenn cavopulmonary shunt in our Ebstein repair, but we recognize it as a viable strategy in those patients for whom reduc-

tion in right-sided volume loading may be beneficial.

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## Pleural effusion and off-pump Fontan procedure

### To the Editor:

We read with great interest the study by Gupta and colleagues<sup>1</sup> "Risk Factors for Persistent Pleural Effusions After the Extracardiac Fontan Procedure," published in the June 2004 issue. Prolonged and excessive pleural drainage after the Fontan procedure is still the subject of debate. In their series of 100 patients, Gupta and colleagues<sup>1</sup> reported prolonged duration of pleural drainage in 37% and increased volume of pleural drainage in 30% after the extracardiac Fontan operation.<sup>1</sup> Lower preoperative oxygen saturation, presence of postoperative infection, smaller graft size, and longer cardiopulmonary bypass time were significantly associated with prolonged and increased pleural drainage.

We have used an off-pump technique for the bidirectional Glenn shunt and the extracardiac Fontan operation in patients without intracardiac anomalies.<sup>2,3</sup> Prolonged pleural effusion was seen in 2 of 30 patients undergoing the bidirectional Glenn shunt (6.6%). Among 10 patients undergoing the off-pump extracardiac Fontan operation, only 1 (10%) had pleural drainage for longer than 2 weeks.

Lower preoperative oxygen saturation and increased preoperative pulmonary arterial pressure may be consequences of increased pulmonary vascular resistance. We surmise that cardiopulmonary bypass causes prolonged and excessive pleural effusion with increase of pulmonary vascular resistance and pulmonary arterial pressure. In patients with cyanosis, the blood flow of the major aortopulmonary collateral arteries may increase during cardiopulmonary bypass, which causes prolonged pleural effusion in some patients.

In conclusion, cardiopulmonary bypass is significantly associated with increased volume of pleural drainage after both the Glenn shunt and the extracardiac Fontan procedure. We believe that pleural drain-

age will decrease with the use of an off-pump technique.

[Response declined]

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## The difference is meaningful: Anatomic coronary-coronary bypass or physiologic coronary-coronary bypass?

### To the Editor:

It was with great interest that I read the communication of Nežić and colleagues.<sup>1</sup> The authors have renewed interest in coronary-coronary bypass (CCB) grafting by highlighting its complementary technical issues, especially in the setting of multiple left anterior descending artery (LAD) stenosis, which might require a synchronous multisided revascularization. The authors have advanced the presumed physiologic advantages related to CCB, aiming thereby to promote their current surgical alternative. However, the current case points out the vigilance that should be paid in distinguishing anatomic CCB from physiologic CCB.

The physiologic advantage of CCB has been highlighted by Biglioli and associates.<sup>2</sup> However, these authors have imputed this physiologic advantage directly to the diastolic coronary flow rather than to its systolic fraction. Biglioli and associates used the initial portion of the right coronary artery as a donor site for the saphenous graft proximal anastomosis providing the LAD. From a physiologic point of view, Biglioli and asso-