follow-up. Differences in functional response between CSA and non-CSA patients may only become evident later or in larger patient cohorts. The studies on posttransplant patients (4,5) had longer follow-up times but also showed similar improvement in both CSA and non-CSA patients. The effect of CRT on CSA in our study seemed larger than in these studies, which may be explained by the fact that OSA patients were not included and new OSA was not observed in our patients during CRT. It is yet unclear why OSA develops in some patients after cardiac transplantation.

Finally, all our patients had ventricular conduction disturbance, which qualified them for CRT. The incidence of ventricular conduction disturbance has not been reported in previous trials on CSA. The association of CSA and cardiac rhythm disturbances such as atrial fibrillation has recently gained interest (6). We hope that our data may stimulate further research into this direction.

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Effects of Percutaneous Left Atrial Appendage Transcatheter Occlusion (PLAATO) on Left Atrial Structure and Function

With great interest we read the study by Hanna et al. (1) on left atrial (LA) structure and function after percutaneous left atrial appendage transcatheter occlusion (PLAATO). In 11 patients, adequate seal of the left atrial appendage (LAA) is reported without affecting LA function or the left upper pulmonary vein. The PLAATO had first been performed in 25 dogs in sinus rhythm. This study by Nakai et al. (2) has been the scientific basis for implanting the device in humans (1,3,4). Although this technique appears very attractive, there are several points of criticism concerning study design, data collection, and interpretation of the results.

1. The LA diameter is reported only at baseline. Furthermore, peak mitral E-wave velocity and diameter, peak systolic, and diastolic velocities of the left upper pulmonary vein were not registered in every patient at baseline, 1, and 6 months. Overall, only 3 of the 11 patients (cases 1, 2, and 5) had all measurements completed. Thus, conclusions based on fragmentary data in this small patient population are limited.
2. Concerning the importance of the LAA as a hormone-releasing site, the study lacks information about levels of natriuretic peptides before and after PLAATO.
3. The investigators state that PLAATO does not interfere with LA function because there was no significant change in transmural or pulmonary venous flow. However, no LA pressure measurements are reported. Because LAA occlusion may result in reduced atrial compliance, data on LA diameter and volume during follow-up would be of interest.
4. Hanna et al. conclude that the PLAATO device does not result in any detrimental anatomic or physiologic changes to adjacent structures. Besides left upper pulmonary vein and mitral valve, however, the circumflex branch of the left coronary artery lies adjacent to the LAA base. Therefore, information on the development of anginal chest pain after PLAATO is of importance.
5. The finding of minimal flow around the PLAATO device in every patient immediately after implantation and at follow-up is in contrast to complete LAA occlusion found at necropsy in dogs of the initial study by Nakai et al. (2). In that study, stability of the device and completeness of LAA occlusion was assessed in formalin-fixed hearts. Formalin fixation, however, results in tissue-shrinkage (5). Thus, complete LAA closure and device stability may have been due to an artificial decrease of the LAA size. Moreover, the mode of conservation may explain the discrepancy between complete LAA occlusion in all dogs at the postmortem study and the small leaks around the device in living dogs immediately after the procedure and during follow-up.
6. Residual flow around the PLAATO device does not preclude thrombus formation in the LAA. However, residual leaks in case of thrombosis may be a new potential mechanism for embolic events as in patients with incomplete surgical LAA ligation (6). Therefore, it would be of great interest whether patients with residual leaks experienced embolic events during follow-up.

Before recommending PLAATO as a therapeutic option in atrial fibrillation patients, more evidence about the long-term effects of this procedure is required.

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REPLY

We thank Dr. Schneider and colleagues for their interest in our study evaluating the effect of percutaneous left atrial appendage transcatheter occlusion (PLAATO) on left atrial (LA) structure and function (1). They list “several points of criticism” deserving of comment.

Our study population is part of the cohort of patients in the PLAATO feasibility trial. The report was based on all but one of the U.S. patients who had completed six-month follow-up. Measurements were available on a majority of patients (>70% at six months) (1). Data analysis showed no statistically significant change in pulmonary venous flow or diastolic transmural flow following PLAATO. As described in our methods, LA size was carefully measured at each time point. Though not included in the final report, no significant change occurred compared to baseline.

Interesting endocrine functions of the left atrial appendage (LAA) have been detailed by Stöllberger et al. (2). Human data on atrial appendectomy are limited. To our knowledge no data suggest detrimental clinical effects of LAA occlusion attributable to a decrease in atrial natriuretic peptide. Yoshihara and colleagues have indicated that exclusion of the LAA without exclusion of the right atrial appendage has even less effect (3,4). Data concerning endocrine LAA function were not part of the PLAATO trial and remains an interesting area for research.

The circumflex coronary artery is variable in its relation to the LAA. The artery runs in the atrioventricular groove and is separated from the base of the LAA by atrial tissue. Oversizing of an occlusion device could theoretically result in arterial compression. We used careful angiographic and echocardiographic sizing. This and postimplant residual flow around PLAATO make compromise of circumflex flow unlikely. Clinical data so far support this.

Finally, Dr. Schneider and colleagues re-emphasize the point that we made in our Discussion section. The impact of minimal residual flow around the device on the occurrence of stroke has to be assessed when the clinical follow-up is reported.

The aim of our study was to show no detrimental effect of PLAATO on pulmonary vein flow and diastolic transmural flow in our patient population. Clinical follow-up data will be reported for the entire PLAATO cohort. We agree that long-term data will help answer many questions about the efficacy of PLAATO, but we believe that percutaneous LAA occlusion will offer an important option for selected patients with atrial fibrillation.

Is Aspirin Resistance or Female Gender Associated With a High Incidence of Myonecrosis After Nonurgent Percutaneous Coronary Intervention?

We have with great interest read the report by Chen et al. (1) published in the March 17 issue of the Journal. The prevalence of aspirin resistance among patients with different manifestations of atherosclerosis has been well established. However, studies addressing the clinical relevance of aspirin resistance are still lacking. Therefore, studies as the one performed by Chen et al. (1) should be appreciated.

To understand the clinical importance of the results presented, however, we will take this opportunity to ask the investigators whether the gender of the patients was included in the multivariate analysis identifying independent predictors of creatine kinase-myocardial band (CK-MB) elevation after percutaneous coronary intervention (PCI)?

Female gender has been proposed to be a risk factor for mortality and morbidity in relation to the performance of PCI (2,3). This observation has been partly explained by older age, more severe heart failure, an increased prevalence of co-morbidity, and the presence of smaller coronary arteries in women compared with men.

Chen et al. (1) showed that aspirin resistance is significantly more prevalent in female (44.8%) than in male patients (19.7%). This difference between genders in the occurrence of aspirin resistance may in part account for the observed increased risk for experiencing complications in relation to the PCI procedure (1). Unfortunately, from the data presented it is not possible to decide whether gender was included in the multivariate analysis. To put the results of the study by Chen et al. (1) into an appropriate clinical perspective, we would like the investigators to inform