signals previously labeled as isovolumic relaxation flow, add further interest to these interesting signals. Certainly it is conceivable that the reversal of pressure difference between the left ventricular apex and left ventricular outflow tract that they have nicely shown on their pressure tracings may be the pressure correlate of flow from the base toward the apex that we have observed (1). Such careful studies will surely add to understanding this interesting signal.

We also admire the work of Brotsaert et al. (2) and we believe the principles they have suggested may be most interestingly related to patients with hypertrophic cardiomyopathy with systolic gradient.

Although we encourage and admire the careful studies done by these authors, we are troubled by some features of the tracings in the figure they present. There is some question regarding the origin of the phonocardiographic signals and, more significantly, some question of correct registration in time between the Doppler and pressure recordings. Inspection of this figure shows the QRS complex of the electrocardiogram as much broader on the Doppler tracing than on the pressure tracing. This has apparently been used for primary registration, and the termination of the QRS complex on both records matches. However, if one assumes the onset of the QRS complex may be the correct registration, then the onset of the intraventricular flow velocity signal would occur beginning with S1, registered on the phonocardiogram rather than 40 ms before it. Thus, the signal in question would be during the isovolumic relaxation period. The phonocardiogram itself is presumed from one of the catheters within the ventricle. However, there is some question regarding the origin of the phonocardiographic signals and, more significantly, some question of correct registration in time between the Doppler and pressure recordings. Inspection of this figure shows the QRS complex of the electrocardiogram as much broader on the Doppler tracing than on the pressure tracing. This has apparently been used for primary registration, and the termination of the QRS complex on both records matches. However, if one assumes the onset of the QRS complex may be the correct registration, then the onset of the intraventricular flow velocity signal would occur beginning with S1, registered on the phonocardiogram rather than 40 ms before it.

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Problems in Nomenclature: Bulboventricular Foramen Versus Ventricular Septal Defect!

The morphologic relation between hearts with tricuspid atresia and those with double inlet left ventricle continues to be a controversial topic. Clinical experience, however, has now shown that the problems presented by both lesions in the setting of discordant ventriculoarterial connections are very similar. This is further endorsed by a recent article in the journal (1). The problem is caused by restriction, in both entities, of a communication between the large and small ventricular chambers. The nomenclature of these ventricular chambers has been extensively debated and, as yet, there is no consensus concerning the most appropriate terminology. Surely the time has now come to move toward a unified terminology because to call the obstructed communication a "bulboventricular foramen" in one lesion yet a "ventricular septal defect" in the other (1) must suggest that the structures are morphologically dissimilar. They are not (2). In terms of anatomy, the intraventricular communications in "single left ventricle" and tricuspid atresia are identical. Common sense should now dictate that hearts with an intraventricular communication cannot logically be described either as "single ventricle" or "univentricular."

In the past, my colleagues and I (3) constructed formidable conventions to distinguish "ventricles" from "nonventricles" so as to preserve a contorted logic that justified calling hearts "univentricular" when they possessed two ventricles. We now recognize the futility of this approach (4). There is not need to describe hearts as "single left ventricle" when they can be described with greater accuracy and precision as "double inlet left ventricle." Acceptance of the latter term would also remove the ambiguity of "a univentricular heart of left ventricular type" with a "rudimentary right ventricle" (5). Nomenclature, nonetheless, is a matter of personal choice, and observers must retain their freedom to describe structures according to their preference. My reason in writing, therefore, is not so much to complain about use of the term "single left ventricle" (although double inlet left ventricular is, in my opinion, preferable) but to draw your reader's attention to the fact that the "bulboventricular foramen" in single left ventricle is no different
from the "ventricular septal defect" in tricuspid atresia. Both communications would be better described as ventricular septal defects, recognizing at the same time the inescapable fact that both groups of hearts possess two ventricles irrespective of how we choose to describe them.

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References

Standardized ECG Examination

The article by Hancock et al. (1) was interesting, somewhat provocative with respect to future possibilities for both testing and standardization of interpretation of electrocardiograms (ECGs) and provided a basis for supplying ECG interpretation, logic, toward possible computerization of the checklist on the interpretation sheet. I think at least two items have been overlooked. 1) I suggest a line on the checklist for multiform premature complex(es) as well as one for interpolated ventricular ectopic beats. 2) A shortcoming of the list is in the pacemaker function and rhythm section as there is no good way to include interpretation of an ECG in a patient who has a pacemaker. I propose the addition of a line suggesting atrial sensing with ventricular pacing (or ventricular activation) as well as a line indicating intermittent pacing.

This is a good baseline evaluation, but it may also profit from an additional suggested or probable clinical disorder that would include elevated intracranial pressure.

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Reference

Comment

The items mentioned as overlooked were omitted for the sake of keeping the list to a practical length for the examination. Other such items could have been added for the sake of completeness. DDD pacing is partially covered by the term AV sequential pacing, although I agree that modes such as atrial-segment ventricular-paced rhythm are not covered. A list used for diagnostic purposes should certainly be expanded beyond that needed for the purpose of the examination.

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Doppler Echocardiographic Appearance of Cusp Tears in Tissue Valve Prostheses

Chambers et al. (7) report a Doppler sign of rapidly oscillating intracardiac structures without seeming to realize that this sign was reported and the underlying physics elegantly worked out recently by my colleagues Holten et al. (2) at the University of Rochester.

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References

Reply

The main thrust of our study was the association in failing bioprostheses of a common pathologic finding: one torn and two normal cusps) and the same Doppler sign (strain of the regurgitant jet). We were careful to point out that the sign had also been described in other situations (1) and that diastolic flutter in mitral prostheses had also been shown with paraprosthetic leaks (2, 3). The paper referred to by Meltzer, in which the emphasis is on the physical basis of the phenomenon, is complementary to ours.

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