Recording Apexcardiograms

To the Editor:

This is to call attention to the artificial recordings by Dr. Kavalier et al. in their article on “The Apical A Wave versus the Fourth Heart Sound in Assessing the Severity of Aortic Stenosis (Circulation 51: 324, 1975). The authors use the combined apex pickup and dynamic microphone (Hewlett Packard #62-1500-C13) for recording the apexcardiogram (ACG); although they state this pickup has a time constant of 1.8 seconds, they overlook the fact that air leaks are easily produced with this pickup. Indeed, if I were to incriminate one piece of equipment more than any other that has given apexcardiography a “bad name,” it would be this pickup and the technique recommended by Benchimol and Dimond.1 The authors should have deduced in their figure 1 that an ACG with an “a” wave of about 30% (by my estimate) in a patient with just aortic stenosis should have been accompanied by a sustained systolic wave. Since the systolic wave in figure 1 has a sharp E point and downslope, this should have alerted them that this was a mechanically differentiated tracing.

In our experience the most satisfactory pickup for recording apexcardiograms has been the end of an ordinary stethoscope with the diaphragm removed. The B-D Fleischer endpiece in varying sizes up to 4.2 cm and a depth of 5 mm gives the best recordings. We have compared this latter pickup to many others currently in use and have found that most pickups supplied by manufacturers of recorders produce wave form distortion.2 It is hoped that those individuals who wish to record ACGs will use the simple pickup described above and thereby avoid more confusion resulting from faulty techniques.

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References

The authors reply:

We agree that air leaks can cause serious distortion of pulse recordings. Concerning our equipment, Kastor et al.1 have described frequent air leaks associated with Hewlett Packard Piezoelectric microphone (#874). This problem can be easily remedied with silicone lubricant applied between the transducer housing and gasket, rendering the tracings perfectly adequate for clinical use. We have long since abandoned this transducer, however, in favor of more reliable equipment, i.e., the Lumiscope Model #MP-1A described in our report, and more recently, the Siemens’ Model #EMT 30 pulse amplifier and #860 pulse transducer, having a 4 second time constant.

Apexcardiography is a useful, but limited technique which functions far better for timing of the events in the cardiac cycle than for producing reproducible wave morphology. Too much has already been written about the distortion of such recordings caused by an overly short time constant. As a matter of fact, our studies are in agreement with those of Kesteloot et al.3 who found that a time constant of 1.2 seconds or greater was perfectly adequate for clinical apex recording. This value is much shorter than the “minimum standard” of 3 seconds often used by workers in this country. Apexcardiography may develop a “bad name”
Letter: Recording apexcardiograms.
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