ECG Classification of WPW Affects Echo Assessment

To the Editor:

We read with interest the article by Chandra et al., reporting echocardiographic studies in patients with the WPW syndrome. We believe that it is important in communications of this type that uniformity exist in classification of patients with pre-excitation as to anatomical site of earliest ventricular activation. Most workers use a classification based upon that of Boineau et al., as do Chandra and co-workers. However, Chandra et al. appear to misinterpret Boineau’s classification, by utilizing the 30 msec vector in the horizontal plane (which is not described by Boineau et al.) and by ignoring the frontal plane vector of the delta wave. Boineau’s classification employs the initial QRS (delta) vector as reflected in both the frontal and horizontal planes of the scalar electrocardiogram. In principle, a superior initial vector (negative in III, aVf) implies pre-excitation of the diaphragmatic surface; an inferior initial vector (positive in III, aVr) implies pre-excitation of the parietal free walls of the ventricles. The laterality of pre-excitation is determined by the QRS vector in V,. Scrutiny of the authors’ illustrative electrocardiograms reveal some discrepancies with the above described criteria. In figure 1, the first electrocardiogram, shown as an illustration of anterior right ventricular pre-excitation, has a superior initial vector. Most workers would interpret this pattern as reflecting posterior right ventricular pre-excitation. The second electrocardiogram, shown as an example of posterior right ventricular pre-excitation, has a positive delta wave in V, and is more typical of posterior left-sided pre-excitation. The third electrocardiogram, shown as an example of posterior left ventricular pre-excitation, has an inferior initial vector and a negative delta wave in V,, and would be interpreted by most as more typical of lateral rather than posterior left ventricular pre-excitation.

We would also observe that reliance on the partially pre-excited electrocardiogram (as in sinus rhythm) for criteria with which to predict the anatomic location of accessory atroventricular muscle bundles is hazardous. Delta forces in the fully pre-excited electrocardiogram have been shown to be more reliable. It should also be noted that the authors incorrectly interpret normal ventricular activation, which begins not in the “upper part” of the interventricular septum, but rather in the middle and apical thirds of the left septum.

Since many of the authors’ patients may be erroneously classified as to site of pre-excitation, the conclusions regarding echocardiographic patterns associated with specific sites of pre-excitation have to be accepted with reservations.

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References


The authors reply:

To the Editor:

Currently available electrophysiologic studies have emphasized that the spatial direction of the initial forces in Wolff-Parkinson-White patients is quite variable. Epicardial mapping studies in patients operated on with pre-excitation suggest that accessory pathways can be present anywhere on either anulus as well as the interatrial septum and the region of the central fibrous body. Thus, difficulty will be encountered in any attempt to relate the ECG to a unique anatomic site. We used the general concepts of Boineau et al. but emphasized leads V, V, and V, and the 30 msec Frank vector, as detailed in our paper. This was done in order to classify our patients using simple techniques and concepts which would be readily available to most clinicians; in this regard we have followed the approach and classification of Castellanos et al. Our echocardiographic observations should therefore be related to patients classified as we specifically outlined, and may not necessarily apply if additional superior-inferior initial vector criteria were used, as proposed by Wyndham et al. We did not mean to imply otherwise.

We agree that the fully pre-excited electrocardiogram, as achieved by right or left atrial pacing, is a more reliable predictor of the site of accessory pathways. The majority of our patients had no cardiac symptoms or had symptoms unrelated to their WPW, and such invasive electrophysiologic studies did not appear justified.

Conclusions drawn from a relatively small group of patients should always be accepted with caution. However, since submission of our manuscript two other studies of echocardiography in WPW have appeared, one utilizing pacing techniques. Both of these investigations arrived at conclusions similar to ours — that abnormalities of interventricular septal motion occur in Type I (anterior right ventricle) pre-excitation but not Types II and III. Tizcon et al. also emphasized the importance of the anteroposterior delta vector orientation; septal motion was always normal when the delta vector was directed anteriorly and abnormal when it was posteriorly directed (Type I). Information on the orientation of the anteroposterior delta vector is readily obtainable from leads V, and V, and the horizontal plane Frank vector, as we used them.

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