Value of the Vectorcardiogram for Distinguishing Left Anterior Hemiblock from Inferior Infarction with Left Axis Deviation*

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A not infrequent problem in the interpretation of electrocardiograms is the presence of a QS pattern in leads II, III, and aVF. At times, these scalar leads may show an embryonic "r" wave preceding the deep negative complexes. The differential diagnosis of such a finding should include: (1) inferior wall myocardial infarction; (2) co-existing inferior wall myocardial infarction and left anterior hemiblock; (3) isolated left anterior hemiblock.

The scalar electrocardiogram does not readily distinguish the diagnoses and, in fact, left anterior hemiblock can obliterate the electrocardiographic signs of inferior wall myocardial infarction.† The differentiation of these entities is of clinical significance since a physician might be misled in diagnosing or excluding coronary artery disease on the basis of the previously mentioned patterns. We have found that the Frank vectorcardiogram is a superior technique for establishing this differentiation.2,3

Figure 1 shows the typical vectorcardiogram and electrocardiogram from a patient with uncomplicated left anterior hemiblock.4 The electrocardiogram reveals initial r waves and deep S waves in leads II, III, and aVF. The vectorcardiogram shows a superiorly displaced frontal plane QRS loop with initial 25 msec QRS vectors oriented inferiorly. The frontal plane QRS loop rotates in a counterclockwise fashion.

Figure 2 shows the vectorcardiogram and electrocardiogram from a patient with co-existing left...
anterior hemiblock and inferior wall myocardial infarction. The records are similar to those of Figure 1 except for two important features. Embryonic initial r waves are present in scalar leads II, III, and aVF of the electrocardiogram. The vectorcardiogram demonstrates a significant change. Observe the initial 25 to 40 msec QRS vectors which rotate superiorly and to the left in a clockwise fashion, diagnostic of inferior wall infarction.5 The terminal 40 msec QRS vectors rotate in a counterclockwise fashion as described for uncomplicated left anterior hemiblock. As in Figure 1, the frontal plane QRS loop is displaced superiorly. The questionable significance of small initial r waves in the inferior wall leads is clarified by the vectorcardiographic findings, which indicate an associated inferior wall myocardial infarction.

Figure 3 shows the vectorcardiogram and electrocardiogram from a patient with a recent inferolateral myocardial infarction. Note the electrocardiographic frontal plane left axis deviation, with embryonic initial r waves in leads III and aVF. The vectorcardiogram shows superior displacement of the frontal plane QRS loop with initial 25 msec QRS vectors directed to the right and superiorly. In this case, the entire frontal plane QRS loop rotates in a clockwise fashion and there is no associated left anterior hemiblock. From the electrocardiogram alone, it is difficult to deny the possibility that there is co-existing left anterior hemiblock. A suggestive but not diagnostic clue that the hemiblock might not be present is the

**Figure 2.** Vectorcardiogram and electrocardiogram from a 67-year-old man with co-existing left anterior hemiblock and inferior wall myocardial infarction. Note the frontal plane left axis deviation and small electrocardiographic r waves in scalar leads II, III and aVF. Ischemic ST segment and T wave changes are present in leads I, aVL, V1-V5. See text.

**Figure 3.** Vectorcardiogram and electrocardiogram from a 64-year-old man with a recent inferolateral myocardial infarction. First degree atrioventricular block is present. Note the Q waves in scalar leads I, aVL, V3-V6, compatible with an anterolateral wall myocardial infarction. Abnormal frontal plane left axis deviation is present and there is ST elevation in leads II, III, aVF, and V3-V6. See text.
very small, almost imperceptible r-prime wave seen in a few inferior lead complexes.

Thus we have found that the Frank vectorcardiogram is superior to the scalar electrocardiogram for establishment of the definitive diagnosis in patients with abnormal left axis deviation with or without associated inferior wall myocardial infarction complicated by left anterior hemiblock.

REFERENCES

ANNOUNCEMENTS

Inhalation Therapy Course

Inhalation Therapy Course (XI) (including seminars and workshops), sponsored by Tufts University School of Medicine and the Boston City Hospital, will be held May 8-12, 1972, in the Dowling Amphitheater of Boston City Hospital. This course is aimed primarily for inhalation therapy technicians and interested physicians. Tuition is $100. Applications and information may be obtained from Maurice S. Segal, M.D., Department of Inhalation Therapy, Boston City Hospital, 818 Harrison Avenue, Boston 02118.

Aspen Radiology Conference

The Second Annual Aspen Radiology Conference will be held March 20-24 at the Aspen Institute for Humanistic Studies, Aspen, Colorado. The conference is designed for physicians and scientists interested in diagnostic radiology, nuclear medicine and radiation therapy and will explore the impact of clinical and technological advances in radiologic practice. Topics for discussions include advances in chest, gastrointestinal, genitourinary and neuroradiology involving a tri-radiological approach. Each day will survey the advances in a single radiology subdivision with independent diagnostic, nuclear medicine and therapy sessions. Brief summaries of these morning sessions will be presented to the entire conference for open discussion at the afternoon plenary sessions.

Further information may be obtained from Emanuel Salzman, M.D., Director, Division of Radiology, Denver General Hospital, Denver 80204.

Second International Symposium on Opportunistic Fungus Infection

The mycology program of the Veterans Administration Hospital, Lexington, and the University of Kentucky Medical Center, will present the Second International Symposium on Opportunistic Fungus Infections, March 20-22. For further information, write Michael L. Furlow, M.D., Professor, Department of Community Medicine, University of Kentucky College of Medicine, Lexington 40506.

CHEST, VOL. 61, NO. 1, JANUARY 1972