Old Inferior Myocardial Infarction Recognizable only in Bipolar Chest Electrocardiographic Leads

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Figure 1 demonstrates an electrocardiogram (ECG) excerpt (25 mm/s, 1 cm/mV) from a continuous 12-lead Holter recording acquired with the Mason–Likar electrode configuration in a 65-year-old man who 2 years earlier had suffered from acute ST segment elevation inferior myocardial infarction (MI) with successful revasculatization (coronary angioplasty) of the mid-right coronary artery.

Since the Mason–Likar electrode positions are known to change considerably the standard ECG recorded with peripheral position of the limb electrodes (the inferior leads acquire a more lateral view), a realistic approximation of the standard 12-lead ECG was reconstructed using published coefficients.¹ Neither the original ECG in the Mason–Likar configuration (not shown) nor the reconstructed standard 12-lead ECG (Figure 1) demonstrate signs of old inferior MI. However, the bipolar chest CF leads (with the standard precordial electrodes as positive poles and the left foot electrode as a negative pole) which were computed from the standard 12-lead ECG present QS complexes in lead CF1 to CF3 with notching in CF2 and CF3 (Figure 1) which likely reflect the MI scar.

Points to ponder

Normally, the ECG complexes in the CF leads as well as those in the bipolar chest CL and CR leads (with the negative electrode at the left arm and the right arm) very closely resemble those in the respective unipolar precordial leads, apart from some differences in the amplitude of the waves (see the CL and CR leads in Figure 1).² Therefore, the above findings are abnormal and likely reflect the old inferior MI scar. The case demonstrates the potential usefulness in some conditions of the CF, CL, or CR leads which were widely used in everyday clinical practice³ until approximately 1950. The bipolar chest leads can, of course, be recorded directly (e.g., if the left arm cable is connected to the left foot electrode and the left foot cable is consecutively connected to each of the six precordial electrodes the CF1 to CF6 leads will be displayed consecutively in the channel for lead III). However, if the 12-lead ECG signal is available in a digital form the CL, CR, and CF leads can be reconstructed very easily from the standard 12-lead ECG, as we did with the help of a custom-developed software program in this case.⁴
References


