Access to ECG Raw Data Can Help Researchers, Physicians, and Patients

Mario Jorge Mc Loughlin, MD[a,*], and Pedro Brugada, MD[b]

From the [a] Fundación Centro Diagnóstico Nuclear, Buenos Aires, Argentina and [b] Scientific Director Cardiovascular División Free University of Brussels Brussels, Belgium.

Electrocardiography has greatly benefited from the use of computers. Nevertheless, much of the developments applied to ECG devices have been made by engineers and not by medical doctors because the field has become too technical.

Recently, new ECG methods based on the manipulation of raw data recorded when performing a standard 12-channel simultaneous ECG allow us to obtain new leads[1,2]

The method uses raw data of the standard 12-channel ECG and it is based on the simultaneous comparison of measurements from one unipolar precordial electrode against other one, exploring the heart sector located between these electrodes. This has facilitated the electrocardiographic evaluation of acute anterior infarction[1] and opens new lines of research. Briefly, its electrical basis consists in discarding any electric activity outside the selected electrodes and using the midpoint between both electrodes as the electric zero, in such a way that it divides into positive and negative all forces found to the right or left of that point. These manipulations are carried out with spreadsheets that are open to any physician (Fig 1).

However, many of the commercially available ECG devices in the market do not provide such data, and cardiologists are unable to apply these new methods for diagnosis and control of the patient.

As allowing physicians to access to ECG raw data could result in a great benefit for the patient, and provide this information does not seem to be complicated, it could be desirable that cardiologic associations and

Funding sources: None.
Conflicts of interest: None.
Curr Probl Cardiol 2021;46:100659
0146-2806/$ – see front matter
https://doi.org/10.1016/j.cpcardiol.2020.100659

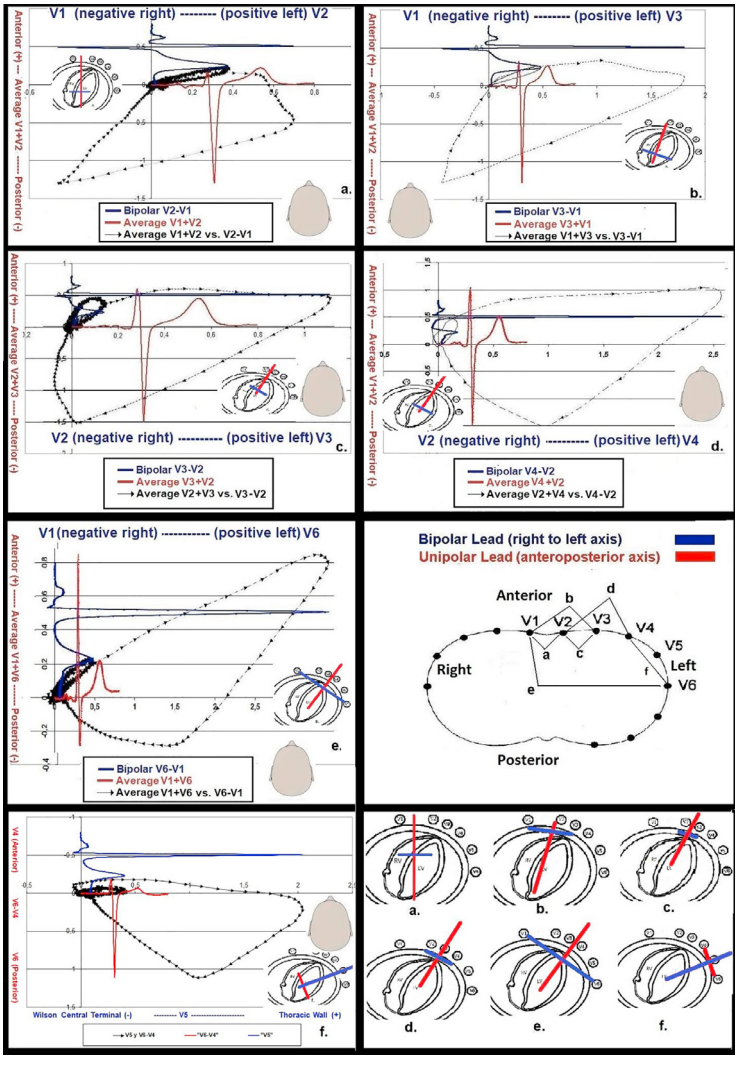

FIG 1. (Control 001). Graphs show the bipolar derivation in blue and the anteroposterior unipolar in red. In order to overlap ECG and VCG graphic, VCG loop is presented as viewed from the patient feet: The midpoint of the V2-V1 lead is between the interventricular septum and the right ventricle and, in normal patients, the onset of QRS reflects the greater ventricular mass of the interventricular septum. Derivation V3-V1 has its midpoint more to the left than V2-V1 and therefore, incorporates a greater amount of tissue from the left ventricle but retains part of the electrical activity of the right ventricle. Differences among unipolar anteroposterior leads from V1 to V3 are subtle, but in the right to left axis, bipolar leads show an increase in positive forces and a decrease in negative ones. By moving the negative electrode to V2 (V3-V2) a decrease in the right terminal forces is observed, but they still exist. In V4-V2, both the positive electrode and the middle of the lead move further to the left and terminal negative vectors are no longer observed. Bipolar lead V6-V1 covers the entire precordium and shows a tracing similar (although magnified) to the standard leads that study the right-left axis. (Color version of figure is available online.)

cardiology journals consider asking all manufacturers of ECG equipment to provide the ability to download study data in a file format that allows physicians to process and perform measurements or look at the new leads if deemed necessary.

Disclosure

Mario Mc Loughlin holds patents on ECG developments.

Acknowledgment

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