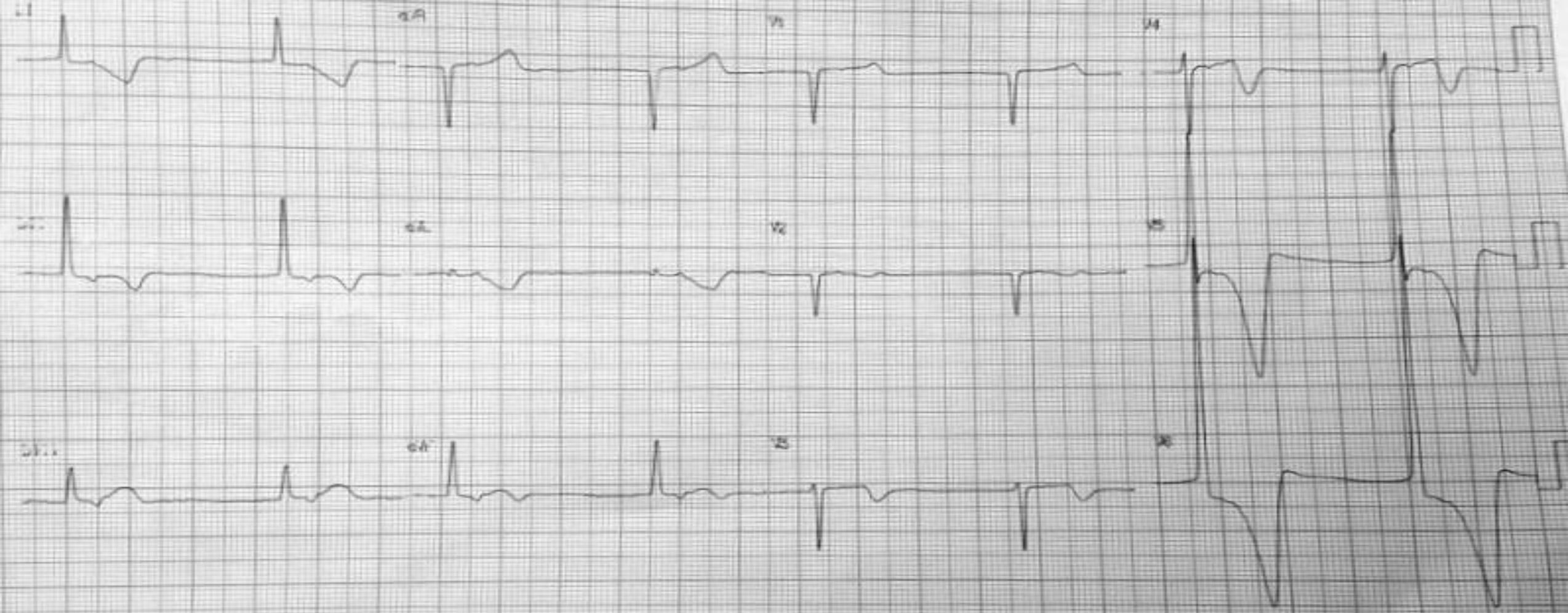


**Case from Raimundo Barbosa-Barros, M.D.**

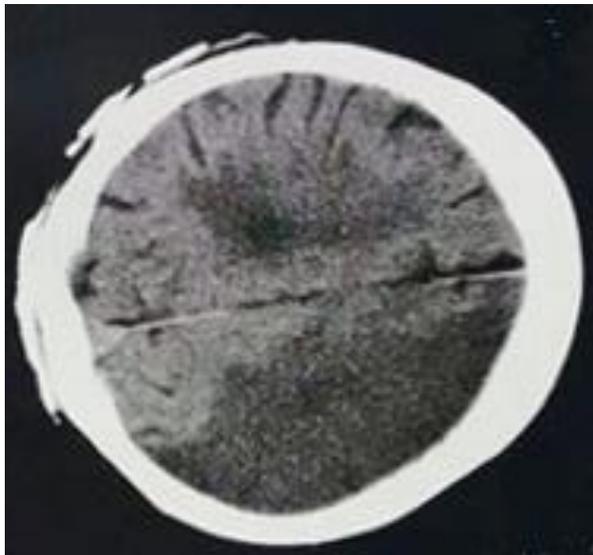
**Characteristic T wave in cerebrovascular accidents in severe hypertensive afro-descendant man**

**ECG analysis by Andrés Ricardo Pérez-Riera, M.D.Ph.D.**



The T waves are deeply inverted with broad base and prolonged QT interval with covering an area many times that of the QRS complex. Often followed by large U waves. The prolonged Q-T interval associated with the pattern was most probably a QU interval. The possible causes of this pattern are: Stokes-Adams attacks associated with complete AV block, coronary artery disease, extreme bradycardia, right ventricular hypertrophy and RBBB, metabolic disturbances, changes during coronary angiography, carotid artery occlusion, and other cerebrovascular accidents. In 1954, Burch et al drew attention to the occurrence of negative deep T wave developing during cerebral disorders. The abnormal T waves resemble very closely those occurring after Stokes-Adams attack. They have been encountered in patients suffering from subarachnoid haemorrhage, cerebral tumors, cerebral infarction and after neurological procedures. They can be reproduced in animals by hyperthalamic stimulation and abolished or prevented by nerve or cord section.

The typical T wave encountered in this electrocardiographic syndrome is a large wave with the same general configuration as found in association with myocardial subepicardial ischemia (ECG below). The T wave is usually negative in the standard and chest leads, although large positive T waves are encountered in the precordial leads recorded from the right of the transition zone in lead V3. Some of the widest and largest T waves seen in clinical electrocardiography are recorded in this syndrome. With improvement of the clinical state, the T waves reverted to a pattern dependent upon the underlying cardiac state, normal or abnormal. In some cases, the T waves are so large that they occupied the entire interval between the R and P complexes; this is not always attributable to tachycardia, with associated shortening of the duration of electrical diastole. Some tracings contained large U waves which are usually located within the T waves and are large and distinct in some instances but discernible with difficulty in others. It is possible, if not usual, that the U wave contributed to the deflections usually interpreted as T waves, but an adequate number of serial tracings is not available to clarify this point. Thus, because of the close association of the U wave with the T wave, the long QT intervals may be QU intervals. It is interesting that the T and U waves often exhibited configurations which resembled those accompanying electrolyte disturbances.



CT scan slice of the brain showing a right-hemispheric ischemic stroke.



### Ischemic T wave

Symmetrical, pointy, wide-based and with variable polarity:

**Negative:** subepicardial ischemia (T wave in “seagull”).

**Positive:** subendocardial ischemia.

**Subepicardial ischemia:** negative polarity, wide base, symmetrical limbs and acute nadir. T wave in “seagull wings”.