Frank’s Sign

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A 66 year old female with underlying hypertension and type 2 diabetes mellitus presented with sudden onset recurrent focal seizures involving left upper limb, left upper limb paresis and facial asymmetry with facial deviation towards right of 3 days duration. Examination revealed spastic left upper limb paresis and upper motor neuron type left facial palsy. MRI brain revealed lacunar infarct in left middle cerebral artery territory. The patient was noted to have bilateral Frank’s sign, which is a diagonal crease in the earlobe that runs backward from the tragus at a 45-degree angle across the lobule to the rear edge of the auricle (Figures 1 and 2). Her baseline ECG revealed left ventricular hypertrophy with no strain pattern. 2D Echo revealed left ventricular hypertrophy with grade 2 diastolic dysfunction and preserved ejection fraction and no regional wall motion abnormalities.

The eponymous sign is named after Dr Sanders T. Frank, who in 1973 first observed it in cohort of patients with angina.¹ It has been hypothesized to be a peripheral marker of likely underlying coronary artery disease and thus being a possible predictor of an unforeseen major cardiac event in otherwise asymptomatic individuals. Frank’s sign is thought to indicate premature aging and loss of dermal and vascular elastic fibers. Although it has limited sensitivity, the sign is more useful diagnostically in persons younger than 60 years of age than in older persons. Although many studies have found it to be a sensitive (75%) sign, its specificity falls way behind (57%).² It has also been found to be a marker of underlying subclinical atherosclerotic vasculopathy in patients who are otherwise found to have absence of any underlying overt cardiovascular disease. Association have also been related with carotid intima-medial thickness and may identify the cohort of patients who are likely to be prone to early aging and premature development of coronary artery disease.³ However in population with low prevalence of coronary artery disease it appears to be of limited value. Its absence does not exclude presence of an underlying coronary artery disease, rather the presence it can help identify and evaluate subset of patients likely prone to early ageing and to the early development of coronary artery disease, whose might benefit with early preventive measures.

There has also been further description about the various grades of severity of this sign and likelihood of its predicting the underlying vascular pathology. One such classification grades it as 1-3 viz. Grade1-small wrinkling < 50% of total diagonal distance between tragus and the free end of earlobe, Grade 2a- superficial crease with visible floor of the crease, Grade 2b- crease > 50% of diagonal distance, Grade 3- deep crease traversing from tragus to the free end of earlobe with floor of crease not visible⁴. However, no association with increased cardiovascular event has been linked to the different grades of severity in the latter.

References