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Value of echocardiography in cardiomyopathies, with special reference to right ventricular dysfunction

Echocardiography is nowadays the simplest and less expensive mode of cardiac imaging. However, its value on RV function needs to know some of the basics in the pathology of this chamber starting by normal RV. RV free wall is very thin (3 mm) as compared to the LV (10 mm). Also, in the normal heart there is practically no contribution of RV in hemodynamics and finally a detailed histological feature shows the presence of an exceedingly large amount of fat (without fibrosis) which explains irreversible RV failure in 12% of heart transplant patients. Therefore, it seems obvious that research efforts have to be directed towards a proper investigation of these parameters which can be reconsidered with recent advances in echocardiography such as strain, speckle technique, 3D echocardiography, etc. Especially, because the mechanism and the trouble of development of this disease has been properly reproduced in the laboratory from iPSC lines. The other main concern properly identified in ARVD is the possible deleterious effect of a superimposed inflammatory phenomenon of myocarditis which can be the result of a particular susceptibility of this genetically modified myocardium by the same gene which has produced the trouble in development. When myocarditis is involved, a wide spectrum of disorders will be produced leading to RV echocardiographic Fractional Area Change FAC which looks a better parameter than Tricuspid Annulus Plane Systolic Excursion TAPSE (Saguner Circulation 2014) but also involvement of the left ventricle which is finally the cause of irreversible heart failure at the end-stage of the disease. In that case, follow-up of patients should be performed by serial echocardiograms paying attention to the TAPSE and FAC but also to the LVEF. Abrupt drop of LVEF associated with troponin release will be the marker of a superimposed myocarditis which may have several patterns of evolution encompassing the fulminant form with irreversible hyper acute heart failure which can be sometimes controlled by LV mechanical myocardial support to minor or even no cardiac deterioration in the most frequent situation. In between, the decrease in LVEF can stop after complete healing of myocarditis of lead to continuous deterioration of cardiac function in case of an induced autoimmune phenomenon. It has been also suspected that the same concept of the deleterious effect of a superimposed myocarditis can be extended to other inherited cardiomyopathies such as IDCM, HCM and even WPW syndrome.

Biography

Guy H Fontaine MD PhD HDR has made 15 original contributions in the design and the use of the first cardiac pace makers in the early 60s. He has serendipitously identified ARVD during antiarrhythmic surgery in the early 70s. He has developed the technique of Fulguration to replace surgery in the early 80s. He has been one of the 216 individuals who have made a significant contribution to the study of cardiovascular disease since the 14th century and one of the 500 greatest geniuses of the 21st Century (USA Books), one of the 100 life time of achievement (UK Book). He has > 900 publications including 201 book chapters. He is a reviewer of 17 scientific journals both in basic and clinical science. He has given 11 master lectures of 90 minutes each in inland China in 2014. He is now developing new techniques for brain protection in OHCA, stroke and spinal cord injury by hypothermia.

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