

ECHOCARDIOGRAPHY AND DIASTOLIC FUNCTION

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Patients with heart defects frequently present with signs and symptoms of systolic function failure. However, recent studies have demonstrated that the abnormalities of diastolic function have an equally significant role in the development of heart failure [1,2]. Currently it is accepted that between 30-50% of patients with clinical heart failure present normal systolic function, pointing to the diastolic dysfunction as being responsible for the physiopathologic abnormalities. This fact corroborates the previously described hypothesis of the ischemic cascade in which the diastolic dysfunction precedes systolic dysfunction. Thus, it is important to understand and to recognize abnormalities of diastolic filling to arrive at the correct diagnosis, prognosis and treatment [3-6].

Doppler echocardiography became a fundamental tool in the evaluation of the diastolic function and of ventricular filling pressure [3]. The physiology of the diastole and diastolic dysfunction are seen in respect to different aspects. These are the cellular aspect (metabolic including relaxing), mechanical aspect (cavitary represented by the distensibility or complacency) and clinical aspect (expressed by the signs and symptoms) can be studied and interpreted from the excellent synoptic state (Figure 1), proposed by OMMEN & NISHIMURA [7].

The patients are initially divided into two large subgroups in respect to the systolic function. As

mentioned, patients who already presented with systolic dysfunction have differing degrees of diastolic dysfunction characterized by Doppler echocardiography of the transmitral flow using the E/A waves ratio and the E wave deceleration time. Thus, Grade 1 corresponds to alterations in the pattern of distensibility and $E/A < 1$ and Grade 2 to the pseudo-normal pattern which can already present signs of high filling pressures. Finally, Grades 3 and 4 correspond to a restrictive pattern which can be separated into reversible (Grade 3) and irreversible (Grade 4) by the Valsalva maneuver or reduction of the pre-load with significant prognostic implications [4,5]. On the other hand, patients with normal systolic function require a more detailed study, involving the E wave amplitude of the transmitral flow measured by Doppler echocardiography compared with the amplitude of the tissue e' wave on the Doppler curve at the mitral ring. The left atrial volume separates the subgroup of patients with normal systolic function indexes ($FE > 50\%$) and intermediate indexes of diastolic dysfunction ($E/e' = 8-15$) and together with the E/A ratio < 1.5 or > 1.5 identifies patients with high ventricular filling pressures giving recognized clinical, prognostic and therapeutic relevance. The behavior of the left atrial volume post acute myocardial infarction in rats, studied by GELAPE et al. and published in this edition of the BJCVS on page 63, proved to be a sensitive indicator of the diastolic dysfunction.

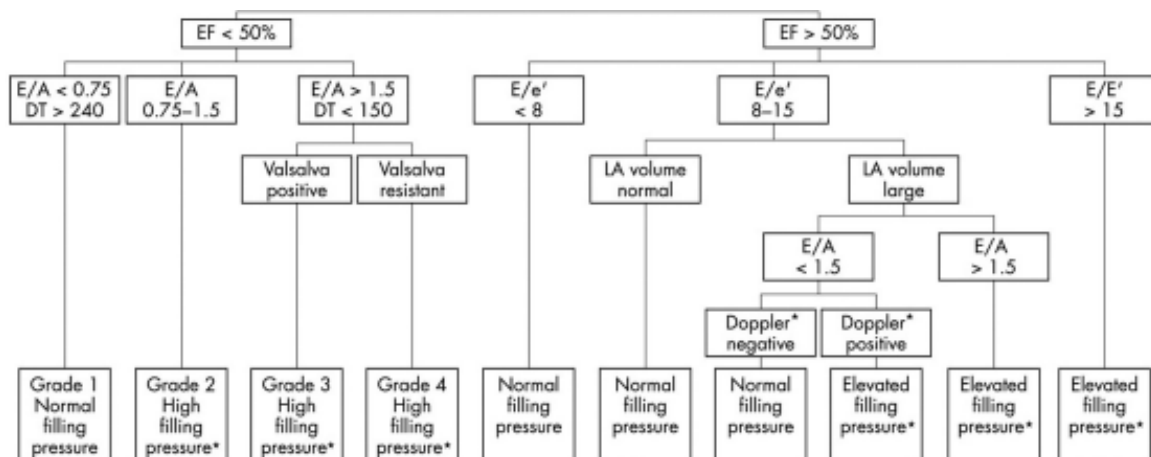


Fig. 1- systematized evaluation of the diastolic function and filling pressures. Variables obtained from the bidimensional image and the Doppler echocardiography are utilized to immediately classify the diastolic function. In general, high filling pressures must be confirmed by several criteria such as: E/e' , E/Vp , difference dur-A, Valsalva control, TR speed, etc. [7].

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