Cardiomyopathy as though it were a matryoshka doll

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To diagnose cardiomyopathy resembles a matryoshka doll, especially, dilated cardiomyopathy does. Professor Bernhard Maisch overviewed the historical change of the concept and the classification of cardiomyopathies. The classification was initially based on the left ventricular shape and function. Pathological examination, endomyocardial biopsy and various imaging modalities opened new fields according to the myocardial histopathology, infectious organisms, and inflammatory factors. Recent growing knowledge from gene analysis and gene-manipulated animals promoted development of a new concept and a new classification system of cardiomyopathies. Now, the evolution of the research in this field is midway toward the understanding of all the cardiomyopathies.

Etiology-based diagnosis of cardiomyopathies has still been difficult in recent clinical medicine. Every physician has to peel off the surface phenotype of the disease, then the next inner phenotype, and over and over again until arriving at the core etiology. The diagnostic process becomes complex confounded by the effects of myocardial remodeling and ventricular remodeling seen in heart failure. In the case of dilated cardiomyopathy, the presentation is usually congestive heart failure with an enlarged and hypokinetic left ventricle. The initial phenotype is superimposed by cardiosuppressive factors derived from congestive heart failure, such as an elevated left ventricular end-diastolic pressure, myocardial ischemia, myocardial interstitial edema and elevated neurohumoral mediators. Clinicians have to peel off the surface phenotype by managing congestive heart failure; and, after that, significant improvement of cardiac function may occasionally be apparent. The second inner phenotype is also influenced by some mechanisms of ventricular remodeling, such as tachycardia and ventricular dyssynchrony. The second phenotype will be taken off by the appropriate control of these factors for several weeks. As a result, clinicians are able to see the inner phenotype, but that may be still not be the definitive goal. The third phenotype is affected by myocardial remodeling, such as cardiomyocytes hypertrophy, interstitial fibrosis, increased fetal gene expression, and suppressed adult gene expression. In order to peel off the third phenotype, a considerably long period is necessary, up to as long as several months. The therapeutic method to reverse myocardial remodeling is still not standardized. It may not be uniform for all patients. Then is the next inner phenotype the last etiology-specific one? Yes, and/or unknown. The development of medical science may bring clinicians deeper inside. In some patients, there may be no etiology-specific phenotype, but an old scar from a previous myocardial injury and a great amount of remodeling can produce an entire clinical phenotype.

Elucidation of the etiology and clarification of the pathogenesis are fundamentally important to create effective therapies for diseases. Clinical examination methods, imaging modalities, and gene analyzing methods have developed significantly over the past few decades. Gene analysis is expected to become more common and convenient in clinical cardiology for the broad spectrum of society in the not too distant future. Correction of gene abnormalities are difficult but alternative approaches for the therapy of gene defects may be discovered. Cardiac remodeling is expected to be reversible, and myocardial loss is believed to be irreversible. Therefore, the discrimination between cardiac suppression by remodeling and myocardial damage by underling etiology is of utmost importance. If some biomarkers play a role in the discrimination or in the estimation of remodeling, those will be very useful in clinical practice. Induction of reverse remodeling and the approach to the underling etiology are the two main therapeutic targets in patients with cardiomyopathies.

And, as in all others, the accumulation of the past scientific knowledge will be necessary and contribute to the future development and better understanding of the field of cardiomyopathy.

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