**A NEW APPROACH TO HEART VALVE DISEASE: INTERVENTION OR PREVENTION?**

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Heart valve disease creates a major public health burden of heart failure and death, currently met with interventional repair and replacement. There is growing recognition that valves are not passive but even in adults remain dynamic and accessible for treatment. This concept motivates efforts to reduce the clinical progression of heart valve disease by combining early detection by imaging with modification of underlying disease mechanisms. In degenerative mitral valve disease, recently discovered genetic mutations causing valve elongation reveal that early developmental changes initiate progressive long-term disruption of valve structure and mechanics. Importantly, changes in structural molecules also have a regulatory role, and alter growth factor signaling and cell migration, promoting progressive disease. Understanding these structural and regulatory interactions can allow us to develop approaches to limit progression to valve degeneration with clinical complications that impact the overloaded myocardium. Mitral valve enlargement also determines ventricular outflow tract obstruction in hypertrophic cardiomyopathy, and can be stimulated by potentially modifiable paracrine valvular-ventricular interactions. In the remodeling infarcted ventricle, the stretched mitral valve can adapt to ventricular expansion through endothelial-to-mesenchymal transformation; however, maladaptive inflammatory processes shorten and fibrose the leaflets and augment mitral regurgitation, increasing heart failure and mortality. These pathways can be modified to yield more favorable adaptive leaflet changes. An approach that bridges clinical and basic scientists is leading to the discovery of new opportunities to improve the natural history of valve disease.