colleagues, one of these authors (E.A.G.) generated the hypothesis that reductions in diastolic stresses were altering signaling from titin and other mechano-transducers, decreasing the triggers for remote myocyte apoptosis and negative remodeling.

The model created by Onohara and colleagues will help us tease out these pathways, understand the ideal patients for reshaping therapy, and perhaps identify other therapies to block these remote effects. Effects are only spooky when you don’t understand them.

References

Commentary: Reshaping ventricular geometry of mice and men: How long is the string?

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Adverse left ventricular (LV) remodeling in ischemic cardiomyopathy is an appealing target for surgical therapy. First described by Cooley in 1958, surgical ventricular reconstruction promised improvements in LV volumes, ejection fraction, functional class, and even survival.1,2 Since then, a variety of techniques, with and without cardiopulmonary bypass, have been described.2-4 Onohura and colleagues2 report the results of an experimental trial of an LV shaping device used in a rat model of ischemic cardiomyopathy. In their model, ischemic cardiomyopathy was induced via ligation of the coronary artery. Three weeks later the investigational group underwent an LV reshaping procedure by intraventricular string connected to silicone pads placed on the beating heart to reduce the short access diameter and restore elliptical LV shape (Figure 1, A and B). At 12 weeks, rats with the reshaping device had improved LV volumes, decreased wall stress, increased LV wall thickness, and decreased myocardial fibrosis. These
positive findings suggested a potential benefit for LV reshaping, which theoretically can be achieved via a similar procedure without the need for cardiopulmonary bypass or aortic crossclamping. Where to from here? We could not help recalling the prophetic words of Scottish poet Robert Burns (1759-1796): “In proving foresight may be vain: The best laid schemes of mice and men go often awry.”

It should be remembered that surgical ventricular reconstruction with coronary artery bypass grafting, compared with isolated coronary artery bypass grafting, was studied in the Surgical Treatment for Ischemic Heart Failure randomized control trial. Despite achieving an improvement in LV volumes, there was no significant improvement in survival, hospitalization, or functional class with ventricular reconstruction. The negative results of this landmark trial have significantly decreased enthusiasm for surgical ventricular reconstruction. Yet, a novel remodeling technique using a similar principle of the intraventricular string (Revent-TC; Bioventrix, San Ramon, Calif) has been successfully used clinically and is now approved by the Food and Drug Administration. This device has the capacity to remodel the LV and to exclude ventricular aneurysm (Figure 1, C and D). Although this device has demonstrated promising clinical results, it has not yet been subjected to a rigorous, randomized controlled trial. The technique does not require cardiopulmonary bypass and can be applied via less-invasive incisions. Because this device has been used clinically, the findings of the current study in rats can potentially be translated into clinical practice. Will this promising concept result in sustained long-term improvement in the outcomes of patients with ischemic cardiomyopathy? It is yet to be seen.

References