

Restoration of left ventricular geometry and improvement of left ventricular function in a rodent model of chronic ischemic cardiomyopathy.

Authors: Yu J, Christman KL, Chin E, Sievers RE, Saeed M, Lee RJ

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Abstract:

OBJECTIVES: Various approaches to myocardial reconstruction have been developed for the treatment of congestive heart failure resulting from ischemic cardiomyopathy.

METHODS: In this study we determined whether in situ application of polymers could reshape left ventricular geometry in a chronic rodent model of ischemic cardiomyopathy.

RESULTS: We demonstrate that alginate and fibrin can augment left ventricular wall thickness, resulting in reconstruction of left ventricular geometry and improvement of cardiac function. Echocardiographic results at 5 weeks after injection of alginate demonstrated persistent improvement of left ventricular fractional shortening and prevention of a continued enlargement of left ventricular dimensions, whereas fibrin glue demonstrated no progression of left ventricular negative remodeling. There was increased arteriogenesis in both the alginate and fibrin glue groups compared with that seen in the phosphate-buffered saline control group. Infarct size was significantly reduced in the fibrin group ($P < .05$), and there was a trend toward a smaller myocardial infarction in the alginate group.

CONCLUSION: Intramyocardially injected polymers can be used to reshape the aneurysmal left ventricle and might therefore be an approach for myocardial reconstruction and a potential option in

treating chronic heart failure in human subjects.