Hypothesis

Cell delivery to the infarcted heart has emerged as a promising therapy but is limited by very low acute retention and engraftment of cells. The hypothesis was that acute retention of cells in a myocardial infarct rat model may be improved by the use of biomaterial delivery vehicles.

Methods

Encapsulated cell survival in hypoxic ischemic conditions was quantified for each biomaterial. Cells were quantified 24 hours post-implantation in a rat myocardial infarct model with five groups (n=8); saline injection (clinical standard) two injectable gels (alginate, chitosan β-gp) and two epicardial patches (alginate, collagen).

Results

Cells in biomaterials had superior viability than those in the control (2D TC plate) at 6 days in hypoxia/ischemia.

Conclusion

Injectable gels and epicardial patches were demonstrated to improve acute retention of cells when compared to a saline control. Injectable gels enable immediate myocardial delivery while epicardial patches facilitate superior retention and could potentially sustain cell delivery over extended periods. These biomaterial approaches should be considered for future cell therapy applications.