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Fibroblast growth factor 2 affects vascular remodeling after acute myocardial infarction

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**BACKGROUND AND OBJECTIVES**

- After acute myocardial infarction, vascular remodeling in the peri-infarct area is essential to provide adequate perfusion, prevent additional myocardial loss, and aid in the repair process.
- Fibroblast growth factor 2 (FGF2) is essential to the recovery of contractile function and limitation of infarct size after cardiac ischemia-reperfusion (IR) injury.
- The role of FGF2 in vascular remodeling after cardiac IR injury is currently unknown.

**METHODS**

Animals: Male Fgf2 knockout mice and wildtype littermate controls (8-10 weeks of age) maintained on a C57BL6 background were generated as previously described. Mouse Model of Closed-chest Cardiac Ischemia-Reperfusion Injury: The mouse model of closed-chest cardiac ischemia-reperfusion injury was performed in the Mouse Cardiovascular Physiology Core at Washington University in St. Louis School of Medicine. Mice were anesthetized with ketamine/xylazine (100/10 mg/kg) intraperitoneally and secured in a stereotaxic frame mounted on a mating table. A left mini-thoracotomy and the pericardium were dissected. An 8-0 polypropylene suture was passed under tubing forming a loose snare around the LAD and exteriorized through each side of the chest wall and the chest wall was closed. The mouse was removed from the instrument and allowed to recover for 1-2 minutes before being returned to the animal care facility. The LAD was occluded by tightening the suture snare with a forceps until ST segment elevation appeared on the EKG showing LAD occlusion and was continued for 90 minutes until ST segment elevation appeared on the EKG showing LAD occlusion and was continued for 90 minutes. The suture ends were pulled apart gently to observe ST segment changes during ischemia and reperfusion. The suture was then exteriorized through each side of the chest wall and the chest wall was closed (Figure 1B). The mouse was removed from the instrument and allowed to recover for 1-2 minutes before being returned to the animal care facility.

**RESULTS**

- Fgf2 knockout hearts show increased vessel diameter at 7 days after IR injury. n=3-8, *p<0.05 vs. wildtype, #p<0.05 vs. Fgf2 KO Sham.

**CONCLUSION**

This study demonstrates the necessity of endogenous fibroblast growth factor in vascular remodeling in the peri-infarct zone in a clinically-relevant animal model of acute myocardial infarction. The findings suggest a potential role for modulation of FGF2 signaling as a therapeutic intervention to optimize vascular remodeling in the repair process after myocardial infarction.

**REFERENCES**