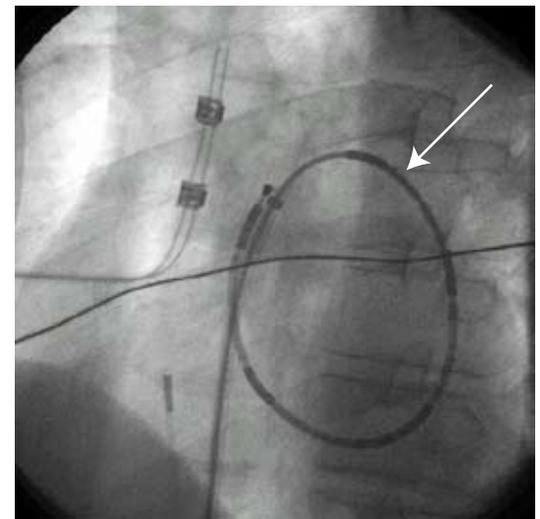


MRI
CATHETER
GUIDANCE

In Vivo Real-Time MRI Catheter Guidance Proves Feasible

In the setting of heart rhythm dysfunction, it is sometimes necessary to map out, assess, and treat the electrical pathways in the heart. Electrophysiological studies of the heart achieve this and entail directing catheters to specific locations within the heart. Currently, physicians employ conventional fluoroscopy to guide the catheters. However, MRI affords superior soft-tissue visualization compared to fluoroscopy and lacks fluoroscopy's radiation. Thus it would be advantageous to place catheters under MRI guidance, rather than the conventionally used fluoroscopy. Potential barriers to electrophysiological studies are the magnetic force and electromagnetic interference inherent in MRI. Reporting in *Circulation*, researchers at Johns Hopkins University achieved successful intracardiac positioning of catheters in dogs, and performed electrograms and pacing with the catheters. No evidence of thermal injury occurred. Subsequently, the researchers achieved two human real-time, MRI-guided catheter mapping studies.^{1,2} **Conclusion: Real-time, MRI-guided electrophysiology studies prove feasible – and afford better soft-tissue visualization and lack radiation compared to conventional fluoroscopy.**



Conventional fluoroscopic image showing a specially designed, multiple-electrode loop ablation catheter (arrow) deployed in the left atrium during an endocardial, catheter-based Maze procedure.

HGF
EMPHYSEMA

Intranasal HGF Reverses Lung Emphysema in Mice

Chronic respiratory disease is the fourth leading cause of death in the United States and 4.1 million adults have been diagnosed with emphysema.^{3,4} Hepatocyte growth factor (HGF) affects multiple factors, including stem cells, epithelial proliferation, and wound healing.⁵ A recent study from Japan evaluated the intranasal administration of HGF on mice with elastase-induced emphysema. The HGF inhalation occurred twice a week for one to four weeks. Published in *Molecular Therapy*, the results revealed significant amelioration of airspace enlargement and alveolar destruction. Within two weeks, elevated static lung compliance returned to control levels. The authors report: "...intranasal treatment with HGF reverses both the physiological and morphometric changes of lung emphysema, possibly through stem-cell mobilization and alveolar regeneration."³ **Conclusion: Intranasal human growth factor reverses induced emphysema in mice.**

MRI

Imaging of *in Vivo* Single Neurons Shows Cells Take on New Roles after Stroke

Stroke ranks third (behind heart disease and cancer) as a leading U.S. cause of death, killing 150,074 people in 2004 alone.⁶ The process of stroke recovery is thought to be accomplished by living brain cells assuming the tasks of injured ones. To assess whether single neurons perform new functions at the expense of their original ones, versus acquiring multiple roles, researchers at the University of British Columbia performed *in vivo* two-photon calcium imaging.⁷ Using an adult mice model, neurons and glia were studied over two to 8 weeks after ischemic damage. As published in the *Journal of Neuroscience*, the single-cell calcium imaging showed that surviving neurons that normally process information for a single contralateral limb instead processed information for multiple limbs. This peaked at one month after injury; at two months neurons became more selective for a preferred limb. **Conclusion: Imaging of in vivo single neurons after stroke shows surviving cells initially process information for multiple new sites, then become more selective.**

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NEXT ISSUE: MORE CLINICAL TRIAL IMAGING NEWS AND STUDIES



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