MR-guided Thermal Ablation Device for Pancreatic Tumors

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Technology description

Researchers at UCSF (in conjunction with collaborators at Stanford) have developed a MRI compatible endoluminal ultrasound therapeutic device that can be effectively used to target pancreatic tumors for thermal ablation. Use of MR guidance can prevent off targeted destruction of healthy tissue due to both placement accuracy, visualization of soft-tissue; and real-time MR monitoring of temperature and thermal dose of the unique features of this invention allows for the coupling to MRI for 3D non-invasive thermometry which provides for direct volumetric feedback to treatment progress and verification.
An endoluminal ultrasound therapy device capable of operation under real-time MRI visualization for precision directed pancreatic tumor ablation.

Additional Information

Data Availability
Under CDA/NDA

Related Materials
Adams, M. S., Scott, S. J., Salgaonkar, V. A., Sommer, G., & Diederich, C. J. (2016). Thermal therapy of pancreatic tumours using endoluminal ultrasound: Parametric and patient-specific modelling. International Journal of Hyperthermia, 1-15.
Adams, M. S., Scott, S. J., Salgaonkar, V. A., Jones, P. D., Plata-Camargo, J. C., Sommer, G., & Diederich, C. J. (2015, March). Development of an endoluminal high-intensity ultrasound applicator for image-guided thermal therapy of pancreatic tumors. In SPIE BiOS (pp. 93260F-93260F). International Society for Optics and Photonics.

Additional Technologies by these Inventors
Deployable Applicators for Ultrasound Therapy

Related Cases

2013-181-0

Advantages

The NCI states that pancreatic cancer is the 12th most common cancer in the US; however it is the fourth leading cause of cancer-related death, with a 5-year survival rate of just 4%. Current treatment is often a mix of chemotherapy and sometimes radiation therapy, with only modest survival and palliative benefits. Thermal ablation technologies, including external MR-guided HIFU, are limited in treating pancreatic cancer. Our invention employs endoluminal ultrasound under MRI guidance that creates a targeted tumor debulking therapeutic approach that can potentially increase survival advantages and reduce tumor related pain.

The advantages of this technology includes:

Endoluminal placement allows for decreased off-target destruction of healthy tissues

Real time visualization and monitoring of tissue temperature and tumor ablation

Minimally invasive procedure

Versatile design can deliver hyperthermia or ultrasound mechanical energy to augment radiation therapy or drug delivery to pancreatic cancer

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